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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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IP DEPARTMENT OF PIPER RUDNICK LLP
ONE LIBERTY PLACE, SUITE 4900
1650 MARKET ST
PHILADELPHIA, PA 19103

EXAMINER	
STAICOVICI, STEFAN	

ART UNIT	PAPER NUMBER
1732	

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12

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/913,434	Applicant(s) SEKIDO ET AL.	
	Examiner Stefan Staicovici	Art Unit 1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *68 and 70-77* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *68, 70-77* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 28, 2004 (Paper No. 10) has been entered.

Response to Amendment

2. Applicants' amendment filed April 28, 2004 (Paper No. 11) has been entered. Claims 68, 70-74, 76 have been amended. Claims 1-67 and 69 have been canceled. No new claims have been added. Claims 68 and 70-77 are pending in the instant application.

Specification

3. The abstract of the disclosure is objected to because it is too long. The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. Correction is required. See MPEP § 608.01(b).

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested: "Method of Manufacturing an FRP Structural Body."

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 68 and 70-71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Day (US Patent No. 5,589,243) in view of Raech, Jr. (US Patent No. 3,616,111).

Day ('243) teaches the basic claimed process for manufacturing a FRP article including, stacking a plurality of cores (40) and fiber reinforced sheets (42) to a target thickness (predetermined thickness) and, impregnating said sheets with a resin to form said FRP article (see col. 7, lines 19-37). Further, Day ('243) teaches a core panel (385) sandwiched between fiberglass skins (394) that is impregnated with resin by vacuum (see col. 16, lines 34-55). Further, Day ('243) teaches cores having a specific gravity ranging from 2 to 16 pounds per cubic foot (0.03-0.25 grams per cubic centimeter) (see col. 1, line 66 and col. 2, line 37). Furthermore, Day ('243) teaches that a plurality of stacked cores form a billet having a thickness ranging from 2 inches to 4 feet (col. 13, lines 18-24). Further, Day ('243) teaches that a billet includes 12 or 24 individual core layers (see Figures 1 and 23). Therefore, the thickness of each core layer varies between 0.008 inches (2 inches thick billet with 24 layers) and 4 inches (4 feet thick billet with 12 layers) (less than 20 mm).

Regarding claim 68, although Day ('243) teaches a plurality of stacked plate-shaped cores, Day ('243) does not teach a plurality of stacked plate-shaped cores including a curved

portion having a radius. Raech, Jr. ('111) teaches a plurality of stacked plate-shaped cores (20) including at least one protrusion (curved portion having a radius) (28) (see col. 3, lines 4-26 and Figure 3). Therefore, it would have been obvious for one of ordinary skill in the art to have provided plurality of stacked plate-shaped cores including a curved portion having a small radius (protrusions) as taught by Raech, Jr. ('111) in the process of Day ('243) because, Raech, Jr. ('111) specifically teaches that such protrusions provide a locking mechanism that prevents lateral movement of said stacked plate-shaped cores, hence providing improved alignment during the molding process which provides for an improved molded product.

Specifically regarding claim 70, Day ('243) teaches a plurality of stacked plate-shaped cores that come into contact with each other. Further, Raech, Jr. ('111) teaches a plurality of stacked plate-shaped cores (20) including at least one protrusion that come into contact with each other (curved portion having a radius) (28) (see col. 3, lines 4-26 and Figure 3).

Regarding claim 71, Day ('243) teaches interposed fiber reinforced sheets (42) and (399) (see Figure 35). Further, Day ('243) teaches that reinforcing webs (390) are impregnated with resin (see col. 16, lines 34-55 and Figure 35).

7. Claims 68, 70 and 72-74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seemann, III *et al.* (US Patent No. 5,721,034) in view of Day (US Patent No. 5,589,243) and in further view of Raech, Jr. (US Patent No. 3,616,111).

Seemann, III *et al.* ('034) teach the basic claimed process of manufacturing a FRP article including, providing a core (60), placing a distribution medium (64) having a net-like structure (see column 5, lines 17-20) onto said core (60), wrapping said core (60) and distribution medium

(64) with fiber material (66) to form a wrapped core, placing a vacuum bag (68) over said wrapped core and inserting resin while drawing a vacuum onto said vacuum bag (68) to impregnate said fiber material (66) and form said FRP article (see column 5, lines 11-35).

Regarding claim 68, although Seemann, III *et al.* ('034) teach a processing for making large composite structures, Seemann, III *et al.* ('034) do not specifically teach stacking a plurality of cores. Day ('243) teaches a process for manufacturing a FRP article including, stacking a plurality of cores (40) and fiber reinforced sheets (42) and, impregnating said sheets with a resin to form said FRP article (see col. 7, lines 19-37). Further, Day ('243) teaches cores having a specific gravity ranging from 2 to 16 pounds per cubic foot (0.03-0.25 grams per cubic centimeter) (see col. 1, line 66 and col. 2, line 37). Further, Day ('243) teaches that a plurality of stacked cores form a billet having a thickness ranging from 2 inches to 4 feet (col. 13, lines 18-24). Further, Day ('243) teaches that a billet includes 12 or 24 individual core layers (see Figures 1 and 23). Hence, the thickness of each core layer varies between 0.008 inches (2 inches thick billet with 24 layers) and 4 inches (4 feet thick billet with 12 layers) (less than 20 mm). Furthermore, Day ('243) teaches a core panel (385) sandwiched between fiberglass skins (394) that is impregnated with resin by vacuum (see col. 16, lines 34-55). Therefore, it would have been obvious for one of ordinary skill in the art to have stacked the cores of Day ('243) because, Day ('243) teaches that stacking of cores forms large composite structures, whereas Seemann, III *et al.* ('034) requires cores to form large composite structures, hence suggesting the desirability of stacking of cores as taught by Day ('243) because references teach forming large composite structures.

Further regarding claim 68, although Seemann, III *et al.* ('034) in view of Day ('243) teaches a plurality of stacked plate-shaped cores, Day ('243) does not teach a plurality of stacked plate-shaped cores including a curved portion having a small radius. Raech, Jr. ('111) teaches a plurality of stacked plate-shaped cores (20) including at least one protrusion (curved portion having a small radius) (28) (see col. 3, lines 4-26 and Figure 3). Therefore, it would have been obvious for one of ordinary skill in the art to have provided plurality of stacked plate-shaped cores including a curved portion having a radius (protrusions) as taught by Raech, Jr. ('111) in the process of Seemann, III *et al.* ('034) in view of Day ('243) because, Raech, Jr. ('111) specifically teaches that such protrusions provide a locking mechanism that prevents lateral movement of said stacked plate-shaped cores, hence providing improved alignment during the molding process which provides for an improved molded product.

In regard to claim 70, Day ('243) teaches a plurality of stacked plate-shaped cores that come into contact with each other. Further, Raech, Jr. ('111) teaches a plurality of stacked plate-shaped cores (20) including at least one protrusion that come into contact with each other (curved portion having a small radius) (28) (see col. 3, lines 4-26 and Figure 3). Therefore, it would have been obvious for one of ordinary skill in the art to have provided plurality of stacked plate-shaped cores including a curved portion having a small radius (protrusions) as taught by Raech, Jr. ('111) in the process of Seemann, III *et al.* ('034) in view of Day ('243) because, Raech, Jr. ('111) specifically teaches that such protrusions provide a locking mechanism that prevents lateral movement of said stacked plate-shaped cores, hence providing improved alignment during the molding process which provides for an improved molded product.

Specifically regarding claim 72, Seemann, III *et al.* ('034) a resin distribution medium having a plurality of channels (14, 18) (see column 2, lines 53-65 and Figure 1).

Regarding claims 73-74, Seemann, III *et al.* ('034) placing a distribution medium (64) having a net-like structure (see column 5, lines 17-20) onto said core (60), wrapping said core (60) and distribution medium (64) with fiber material (66) to form a wrapped core, placing a vacuum bag (68) over said wrapped core and inserting resin while drawing a vacuum onto said vacuum bag (68) to impregnate said fiber material (66) and form said FRP article (see column 5, lines 11-35).

8. Claim 75 is rejected under 35 U.S.C. 103(a) as being unpatentable over Day (US Patent No. 5,589,243) in view of Raech, Jr. (US Patent No. 3,616,111) and in further view of Newsom (US Patent No. 4,554,036) and Folsom *et al.* (US Patent No. 5,676,979).

Day ('243) in view of Raech, Jr. ('111) teaches the basic claimed process as described above.

Regarding claim 75, Day ('243) in view of Raech, Jr. ('111) do not teach vacuum impregnation of a portion of a resin molded article that is not impregnated with resin. Newsom ('036) teaches a process of repairing a fiber reinforced composite article including, providing a resin pre-impregnated fibrous repair material at the repair site, placing a vacuum bag over said repair site and drawing a vacuum while curing said resin pre-impregnated fibrous repair material (see Abstract and Figure 2). Therefore, it would have been obvious for one of ordinary skill in the art to have vacuum resin molded a portion of the molded article not impregnated with resin as taught by Newsom ('036) in the process of Day ('243) in view of Raech, Jr. ('111) because,

Newsom ('036) specifically teaches that such a process provides a less expensive method for repairing composite materials, hence providing for improved efficiency. Further regarding claim 75, Day ('243) in view of Raech, Jr. ('111) and in further view of Newsom ('036) do not teach injecting a resin material. Folsom *et al.* ('979) teach a process for repairing resin-dry areas including, injecting resin into said resin-dry area (see column 2, lines 5-25 and Figure 2). Therefore, it would have been obvious for one of ordinary skill in the art to have injected resin rather than using a resin pre-impregnated fibrous repair material as taught by Folsom *et al.* ('979) in the process of Day ('243) in view of Raech, Jr. ('111) and in further view of Newsom ('036) because, Folsom *et al.* ('979) specifically teach that such a process allows for reduced costs and improved structural integrity of composite materials (see column 2, lines 51-59).

9. Claims 76-77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Day (US Patent No. 5,589,243) in view of Raech, Jr. (US Patent No. 3,616,111) and in further view of Newsom (US Patent No. 4,554,036), Folsom *et al.* (US Patent No. 5,676,979) and Seemann (US Patent No. 5,052,906).

Day ('243) in view of Raech, Jr. ('111) and in further view of Newsom ('036) and Folsom *et al.* ('979) teach the basic claimed process as described above.

Regarding claims 76-77, Day ('243) in view of Raech, Jr. ('111) and in further view of Newsom ('036) and Folsom *et al.* ('979) do not teach using a resin distribution medium and a resin permeable peel-ply. Seemann ('906) teach a process of manufacturing a FRP article including, placing a resin permeable peel-ply (7) between a distribution medium (5) and fiber reinforced material (9) to permit uniform distribution of resin upon inserting resin while drawing

a vacuum to impregnate said fiber reinforced material (9) and to allow said resin distribution medium (5) be easily removed (see column 4, line 68 through column 5, line 3 and column 5, lines 10-25 and, Figure 1). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a resin distribution medium having a net-like structure and a resin permeable peel-ply as taught by Seemann ('906) in the process of Day ('243) in view of Raech, Jr. ('111) and in further view of Newsom ('036) and Folsom *et al.* ('979) because, Seemann ('906) specifically teach that a resin distribution allows for uniform resin distribution during a vacuum assisted molding process hence, improving product quality.

10. Claims 75-77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seemann, III *et al.* (US Patent No. 5,721,034) in view of Day (US Patent No. 5,589,243) and in further view of Raech, Jr. (US Patent No. 3,616,111), Newsom (US Patent No. 4,554,036) and Folsom *et al.* (US Patent No. 5,676,979).

Seemann, III *et al.* ('034) in view of Day ('243) and in further view of Raech, Jr. ('111) teach the basic claimed process as described above.

Regarding claim 75, Seemann, III *et al.* ('034) in view of Day ('243) and in further view of Raech, Jr. ('111) do not teach vacuum impregnation of a portion of the molded article not impregnated with resin. Newsom ('036) teaches a process of repairing a fiber reinforced composite article including, providing a resin pre-impregnated fibrous repair material at the repair site, placing a vacuum bag over said repair site and drawing a vacuum while curing said resin pre-impregnated fibrous repair material (see Abstract and Figure 2). Therefore, it would have been obvious for one of ordinary skill in the art to have vacuum impregnated a portion of

the molded article not impregnated with resin as taught by Newsom ('036) in the process of Seemann, III *et al.* ('034) in view of Day ('243) and in further view of Raech, Jr. ('111) because, Newsom ('036) specifically teaches that such a process provides a less expensive method for repairing composite materials, hence providing for improved efficiency. Further regarding claim 75, Seemann, III *et al.* ('034) in view of Day ('243) and in further view of Raech, Jr. ('111) and Newsom ('036) do not teach injecting a resin material. Folsom *et al.* ('979) teach a process for repairing resin-dry areas including, injecting resin into said resin-dry area (see column 2, lines 5-25 and Figure 2). Therefore, it would have been obvious for one of ordinary skill in the art to have injected resin rather than using a resin pre-impregnated fibrous repair material as taught by Folsom *et al.* ('979) in the process of Seemann, III *et al.* ('034) in view of Day ('243) and in further view of Raech, Jr. ('111) and Newsom ('036) because, Folsom *et al.* ('979) specifically teach that such a process allows for reduced costs and improved structural integrity of composite materials (see column 2, lines 51-59).

In regard to claims 76-77, Seemann ('906) teach placing a resin permeable peel-ply (7) between a distribution medium (5) and fiber reinforced material (9) to permit uniform distribution of resin upon inserting resin while drawing a vacuum to impregnate said fiber reinforced material (9) and to allow said resin distribution medium (5) be easily removed (see column 4, line 68 through column 5, line 3 and column 5, lines 10-25 and, Figure 1).

Response to Arguments

11. Applicants' remarks filed April 28, 2004 (Paper No. 11) have been considered.

12. Applicants argue "Day fails to teach or suggest...'providing a plurality of plate-shaped core material, each of which has a curved surface portion having a radius of curvature on at least a part of the core material'..." (see page 5 of the amendment filed April 28, 2004). Further, Applicants argue that "the respective core materials described in Day are all rectangular parallelepiped...and they are quite different in shape from the shape of the invention having a curved surface portion on at least a part of the core material" (see page 5 of the amendment filed April 28, 2004). In response, it is noted that:

(a) One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

(b) Under MPEP §2141.02, "[I]n determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious, but whether the *claimed invention as a whole* would have been obvious" (emphasis added). *See* Stratoflex, Inc. v. Aeroquip Corp., 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983); Schenck v. Nortron Corp., 713 F.2d 782, 218 USPQ 698 (Fed. Cir. 1983).

(c) Day ('243) teaches stacking a plurality of plate-shaped cores (40) and fiber reinforced sheets (42) to a target thickness (predetermined thickness) and, impregnating said sheets with a resin to form a FRP article (see col. 7, lines 19-37). Day ('243) does not teach that said plurality of stacked plate-shaped cores include a curved portion having a small radius. However, it is Raech, Jr. ('111) that has been used throughout prosecution of the instant application to show a plurality of stacked plate-shaped cores (20) including at least one

protrusion (curved portion having a radius) (28) (see col. 3, lines 4-26 and Figure 3). Therefore, it would have been obvious for one of ordinary skill in the art to have provided plurality of stacked plate-shaped cores including a curved portion having a small radius (protrusions) as taught by Raech, Jr. ('111) in the process of Day ('243) because, Raech, Jr. ('111) specifically teaches that such protrusions provide a locking mechanism that prevents lateral movement of said stacked plate-shaped cores, hence providing improved alignment during the molding process which provides for an improved molded product.

13. Applicants argue that the "thickness of Day is not a thickness in the normal 'thickness' direction of the claims but, instead, is actually a thickness in the 'width' direction...the thickness in Day is a measurement direction that is 90° different from the thickness direction in the invention" (see page 6 of the amendment filed April 28, 2004). In response, it is noted that Day ('243) specifically teaches a plurality of stacked cores, a billet, having a thickness ranging from 2 inches to 4 feet (col. 13, lines 18-24). Further, Day ('243) teaches that a billet includes 12 or 24 individual core layers (see Figures 1 and 23). Therefore, it is submitted that the thickness of each core layer varies between 0.008 inches (2 inches thick billet with 24 layers) and 4 inches (4 feet thick billet with 12 layers).

14. Applicants argue that in Raech, Jr. ('111) "the stacked body after stacking is a flat-plate structure as a whole" and as such a "curved surface portion is not formed in the stacked body after stacking" (see page 7 of the amendment filed April 28, 2004). In response, it is noted that Figures 3 and 4 of Raech, Jr. ('111) specifically show a plurality of stacked plate-shaped cores (20) having protrusions, said protrusions existing on the outside surface of the stacked body,

hence forming a "curved portion" in the "stacked body." Furthermore, Raech, Jr. ('111) specifically teaches that said protrusions exist on the bottom and top the resulting panel in order to provide "a high-friction surface for safer takeoffs and landings" (top surface), "an anchor to stabilize the completed pad and keep it from moving on the adjacent soil" (bottom surface) and "an interlocking instrumentality to tie the panels in an upper layer of the pad to panels in a lower layer and prevent lateral movement of the panels" (see col. 3, lines 9-17). Hence, it is submitted that the panel of Raech, Jr. ('111) teaches a "curved surface portion" in the "stacked body."

15. Applicants argue that the prior art does not teach or suggest that "by overlapping the curved surface portions with each other, a similar curved surface portion is formed on the stacked body after stacking" (see page 7 of the amendment filed April 28, 2004). In response, it is noted that Raech, Jr. ('111) teaches a plurality of stacked plate-shaped cores (20) including at least one protrusion (curved portion having a radius) (28) that is formed in *every layer* of said panel *at the same location* (emphasis added) such that by overlapping said layers alignment results between said layers of said panel, said protrusions acting as a locking mechanism that prevents lateral movement of said stacked plate-shaped cores (see col. 3, lines 4-26 and Figure 3).

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stefan Staicovici, Ph.D. whose telephone number is (571) 272-1208. The examiner can normally be reached on Monday-Friday 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael P. Colaianni, can be reached on (571) 272-1196. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Stefan Staicovici, PhD

Primary Examiner 5/8/04

AU 1732

May 8, 2004